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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/675,783	09/30/2003	Frank Eliot Levine	AUS920030486US1	6547

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IBM CORP (YA)	MITCHELL, JASON D
C/O YEE & ASSOCIATES PC	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

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	Application No.	**Applicant(s)**
Office Action Summary	10/675,783	LEVINE ET AL.
	Examiner	**Art Unit**	
	Jason Mitchell	2193	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
  Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on <u>14 August 2007</u>.

2a)☒ This action is **FINAL**.   2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) <u>6-19</u> is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration. .

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) <u>6-19</u> is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☐ All b)☐ Some * c)☐ None of:

      1.☐ Certified copies of the priority documents have been received.

      2.☐ Certified copies of the priority documents have been received in Application No. _____. .

      3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1)☒ Notice of References Cited (PTO-892)

2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3)☐ Information Disclosure Statement(s) (PTO/SB/08)
    Paper No(s)/Mail Date _____.

4)☐ Interview Summary (PTO-413)
    Paper No(s)/Mail Date. _____ .

5)☐ Notice of Informal Patent Application

6)☐ Other: _____.

DETAILED ACTION

1.   Claims 6-19 are pending in this application.

Response to Arguments

2.   **Applicant's arguments with respect to claims 6-19 have been considered but are moot in view of the new ground(s) of rejection.**

Claim Rejections - 35 USC § 101

3.   35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

4.   **Claims 11-15 and 18-19 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter.**

5.   **Claims 11-15 and 18-19** are not limited to tangible embodiments. In view of Applicant's disclosure, specification page 64 in the last paragraph, the medium is not limited to statutory embodiments, instead being defined as including both statutory embodiments (e.g., "recordable-type media, such as a floppy disk") and non-statutory embodiments (e.g., transmission-type media, such as ... radio frequency and light wave transmissions"). As such, the claim is not limited to statutory subject matter and is therefore non-statutory.

6.   Further, claims 11 and 19 recite "A computer program product, which is stored in [and therefore distinct from] a computer readable medium". In view of this language it is

reasonable to read the claim as directed to an abstract idea (i.e. a disembodied

computer program) who's intended use is to be stored in a computer readable medium

and does not itself incorporate the medium. In other words "computer readable

instructions stored on a computer readable medium" recite a statutory computer

program product (assuming the computer readable medium is also statutory). Whereas,

the current claims recite a program product distinct from any physical matter, which is

necessary to meet the requirements of 35 USC 101. Claims 10-15 and 18 depend from

claim 11 and are rejection for the same reasons.

Claim Rejections - 35 USC § 112

7.   The following is a quotation of the first and second paragraphs of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

8.   **Claims 16-19 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement.** The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

9.   Claims 16, and 18-19 recite representing a threshold and count in a second and third "*one* of the plurality of bits". A single bit is only capable of representing numbers between 0-1. Applicant's disclosure does not enable one of ordinary skill in the art to

provide the disclosed and claimed 'threshold' functionality using a count and/or threshold field consisting of a single bit. In other words, a threshold of 1 will be reached each time an instruction is executed. Applicant's specification discloses "Multiple bits may be used to identify a threshold" (see pg. 27, line 10), it is this understanding that will be used in examining the claims. Claim 17 depends from claim 16 and is rejected for the same reason.

10.   **Claims 11-15 and 18-19 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.**

As noted above, the claims 11 and 19 recite "A computer program product, which is stored in a computer readable medium". This language makes it unclear if applicant is seeking protection for the combination of "computer program product" and "computer readable medium" or simply the "computer program product" on it's own. Claims 10-15 and 18 depend from claim 11 and are rejected for the same reasons.

Claim 11 recites "the caller of a routine" in line 19. There is insufficient antecedent basis for the recitation of "the caller" and it is unclear if the recited "a routine" is intended to refer to the "a routine" introduced in line 13. For the purposes of examination the claim will be treated as reading "a caller of the routine" as recited in claim 6.

Claim Rejections - 35 USC § 103

11.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set
> forth in section 102 of this title, if the differences between the subject matter sought to be patented and
> the prior art are such that the subject matter as a whole would have been obvious at the time the
> invention was made to a person having ordinary skill in the art to which said subject matter pertains.
> Patentability shall not be negatived by the manner in which the invention was made.

12.   **Claims 6-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over**

US 6,966,057 to Lueh (Lueh) in view of US 2003/0225917 to Partamian et al.

(Partamian) in view of US 2004/0030870 to Buser (Buser).

13.   **Regarding Claims 6 and 11:** Lueh discloses profiling an application in a data

processing system, the method comprising:

each one of a plurality of individual instructions associated with an indicator that

indicates that each one of the plurality of instructions needs to be monitored (col. 6,

lines 1-3 "a location map where the original code needs to be replaced with a branch or

trap instruction");

an instruction cache, which is included in a processor, for using said indicator to

detect execution of each one of the plurality of instructions, wherein execution of

instructions, which are not associated with the indicator, is not detected (col. 6, lines 1-3

"original code needs to be replaced with a branch or trap instruction"; col. 5, lines 57-67

"Breakpoints can be implemented using ... trap patching and code patching" note that

instructions not indicated in the "location map" will not be monitored and thus their

execution will not be detected);

the instruction cache for detecting execution of a particular one of the plurality of

instructions using the indicator, wherein the instruction is located in a routine (col. 7,

lines 9-16 "instrumentation code passes necessary information to a run-time library

function"; col. 6, lines 1-3 "a branch or trap instruction");

the instruction cache for determining whether the particular one of the plurality of

instructions is 'hot' (col. 4, lines 60-65 "methods that are identified as hot methods

based on the collected profiling information"); and

the instruction cache, responsive to the particular one of the plurality of

instructions having been identified as 'hot', generating an interrupt to pass control to a

monitoring program (col. 9, lines 14-35 "The execution 640 includes ... executing an

event hook function for an event corresponding to the field watch"; col. 7, lines 5-8 "To

support the watch points for fields, the JIT compiler interrupts the execution ... to call

the event hook function"), wherein the monitoring program identifies information

regarding a caller of the routine (col. 5, lines 11-16 "the JIT compiler provides a

mechanism to identify and access the caller's frame context, referred to as unwinding

stack frame.").

14.   Lueh does not explicitly disclose determining whether the instruction is 'hot'

comprises determining whether the instruction has been executed more often than a

threshold value.

15.   Partamian teaches method of determining whether an instruction is 'hot'

comprising determining whether the instruction has been executed more often than a

threshold value (par. [0018] "JVM 1120 includes a threshold to determine whether a

method is hot or not.")

16.   It would have been obvious to one of ordinary skill in the art at the time the

invention was made to compare the profiling information collected by Lueh's "counter

345" (see, col. 4, lines 60-65) to a threshold value, as taught by Partamian (par. [0018])

as an obvious and commonly used method to identify hot methods for recompilation

(Lueh col. 4, lines 60-65 "re-compiles methods that are identified as hot methods").

17.   The Lueh-Partamian combination does not disclose the indicator stored in at

least one existing spare bit in each one of the plurality of individual instructions. Instead

the Lueh reference discloses implementing breakpointing using one of two methods (i.e.

col. 5, lines 57-67 "trap patching and code patching").

18.   Buser teaches a third method of breakpointing in which the indicator is stored in

at least one existing spare bit in each one of the plurality of individual instructions (par.

[0004] providing an instruction field in every instruction ... actions are performed ...

based on the value of the halt identifier field").

19.   It would have been obvious to one of ordinary skill in the art at the time the
invention was made to use Buser's third method of breakpointing in the Lueh-Partamian
combination (e.g. Lueh col. 5, lines 57-67) as an alternate means of providing the
desired functionality (i.e. breakpoints). One of ordinary skill in the art would have been
able to implement the modified system with predictable results.

20.   **Regarding Claims 7 and 12:** The rejections of claims 6 and 11 are incorporated,
respectively; further Lueh discloses:

examining a call stack upon generation of the interrupt (col. 5, lines 11-16
"unwinding stack frame."); and

identifying a caller of the routine from an examination of the call stack (col. 5,
lines 11-16 "the JIT compiler provides a mechanism to identify and access the caller's
frame context").

21.   **Regarding Claims 8 and 13:** The rejections of claims 6 and 11 are incorporated,
respectively; further Lueh discloses the information includes at least one of a caller of
the routine (col. 5, lines 11-16 "the JIT compiler provides a mechanism to identify and
access the caller's frame context") and a number of instructions executed in the routine.

22.   **Regarding Claims 9 and 14:** The rejections of claims 6 and 11 are incorporated,
respectively; further Lueh discloses:

generating a call graph from the information (col. 5, lines 11-16 "unwinding stack

frame.").

23.   **Regarding Claims 10 and 15:** The rejections of claims 6 and 11 are

incorporated, respectively; further Lueh discloses:

selecting the caller of the routine for analysis based on the information gathered

by the monitoring program (col. 5, lines 14-15 "The stack unwinding process starts with

a frame context of the caller").

24.   **Regarding Claims 16 and 18:** The rejection of claims 6 and 11 are incorporated;

further the Lueh-Partamian combination discloses:

indicating that each execution of each one of the plurality of instructions should

be counted (Lueh col. 6, lines 1-3 "a location map where the original code needs to be

replaced with a branch or trap instruction");

identifying a threshold value (Lueh col. 4, lines 60-65 "methods that are identified

as hot methods based on the collected profiling information"; Partamian par. [0018]

"JVM 1120 includes a threshold to determine whether a method is hot or not."); and

a counter to count a number of times each one of the plurality of instructions is

executed (Lueh Fig. 3 counter 345; col. 4, lines 60-65).

25.   It would have been obvious to one of ordinary skill in the art at the time the

invention was made to include the indication that executions of an instruction should be

counted (Lueh col. 6, lines 1-3), threshold value (Partamian par. [0018]), and a counter (Lueh col. 4, lines 60-65) in a first second and third one of a plurality of existing spare bits in each one of the plurality of instructions (Buser par. [0004] providing an instruction field in every instruction ... actions are performed ... based on the value of the halt identifier field" see the rejection of claims 6 and 11). One of ordinary skill in the art would have been able to implement the modified system with predictable results.

26.   **Regarding Claim 17:** The rejection of claim 16 is incorporated; further Buser discloses the use of registers for controlling a meaning of each one of the plurality of bits (par. [0021] "the value of CPU halt identifier field 1002 for that instruction is compared to the value of ... a special register within the CPU").

27.   **Claim 19 is rejected under 35 U.S.C. 103(a) as being unpatentable over US 6,966,057 to Lueh (Lueh) in view of US 5,896,538 to Blandy et al. (Blandy) in view of US 2004/0030870 to Buser (Buser).**

28.   **Regarding Claim 19:** Claim 19 primarily recites a combination of the limitations addressed separately in claims 6-10 and 16-17.

29.   Blandy teaches a threshold value used to identify a hot method (col. 3, lines identifies the hot modules ... After a module has been called a certain number of times")

similar to, and resulting in the same obvious modifications as the Partamian teaching

relied upon in the rejection of claims 6-10 and 16-17.

30.   Further, Blandy teaches a "performance monitor may track the cycle time for a

module" (col. 3, lines 8-10). Accordingly it would have been obvious to one of ordinary

skill in the art at the time the invention was made to use cycle time for the threshold

value as an alternative means of determining a hot method.

Conclusion

31.   The prior art made of record and not relied upon is considered pertinent to

applicant's disclosure.

32.   Applicant's amendment necessitated the new ground(s) of rejection presented in

this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP

§ 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37

CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE

MONTHS from the mailing date of this action. In the event a first reply is filed within

TWO MONTHS of the mailing date of this final action and the advisory action is not

mailed until after the end of the THREE-MONTH shortened statutory period, then the

shortened statutory period will expire on the date the advisory action is mailed, and any

extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jason Mitchell whose telephone number is (571) 272-3728. The examiner can normally be reached on Monday-Thursday and alternate Fridays 7:30-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Meng-Ai An can be reached on (571) 272-3756. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Jason Mitchell/
Jason Mitchell
10/18/07

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